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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/652,842	08/31/2000	Vishnu K. Agarwal	98-0616.05	4065

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EXAMINER

KESHAVAN, BELUR V

ART UNIT

PAPER NUMBER

2825

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/652,842

Applicant(s)

AGARWAL, VISHNU K.

Examiner

Belur V Keshavan

Art Unit

2825

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-24 and 76-81 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-21, 76, 77 and 79-81 is/are rejected.
- 7) ☐ Claim(s) 22-24 and 78 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8. 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 17, 20, 21, 76, 77, 79 and 80 are rejected under 35 U.S.C. 102(e) as being anticipated by Agarwal et al. (U. S. Patent No: 6,201,276 B1).

Regarding claims 17 and 20 Agarwal et al. teach a method of forming a capacitive plate comprising:

Providing, in column 5 and line 59 a first conductive layer in a first environment;

Exposing, in column 5 and line 65, lines 11-12 and line 62, the first conductive layer to a nitrogen free passivation gas *in situ*;

Depositing a second conductive layer in column 6 and lines 21-22, over the first conductive layer.

Art Unit: 2825

Regarding claim 21, Agarwal et al. teach, in column 5, wherein the step of exposing the first conductive layer comprises exposing the first conductive layer to a nitrogen free passivation gas while still in the first environment.

Regarding claims 76 and 77 Agarwal et al. teach a method of forming a capacitor plate in columns 4 and 5 and in figures 2A-2D comprising:

Providing a first conductive layer (14) in a first environment in column 5 line 59;

Exposing the first conductive layer to a plasma comprising a selection of N_2/H_2 , H_2 and NH_3 plasmas in a second environment in column 4, lines 52-62; and

Depositing a second conductive layer (19) over the first conductive layer.

Regarding claims 79 and 80, Agarwal et al teach, in columns 4 and 5 and in figures 2A-2D, a method of forming a capacitor comprising forming a capacitor plate comprising:

Providing a first conductive layer in a first environment in column 5 and line 59;

Exposing the first conductive layer *in-situ* in column 4 and lines 52-58, column 5 and lines 60-61 and in column 5 and line 59 to a selection of diborane, carbon tetra fluoride, CHF_3 , HCl , boron trichloride and mixtures thereof;

Depositing a second conductive layer (19) over the first conductive layer.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The applied reference has a common 1 inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Claims 18 and 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal et al.

Regarding claim 18, Agarwal et al. anticipate claim 17 as above but lack exposing the first conductive layer to a nitrogen free passivation gas *ex-situ*. Agarwal et al. teach exposing, in column 5 line 65, lines 11-12 and line 62, the first conductive layer to a nitrogen free passivation gas *in situ*. It would have been an obvious matter of design choice to expose the first conductive layer to a nitrogen free gas *ex-situ*, since the applicant has not disclosed that exposing the first

Art Unit: 2825

conductive layer to a nitrogen free gas *ex-situ* solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with *in-situ*. (The applicant has claimed in claim 20 exposing the first conductive layer to a nitrogen free passivation gas also *in situ*.).

Regarding claim 81, Agarwal et al. anticipate claim 79 as above but lack exposing the first conductive layer *ex-situ* to a selection of diborane, carbon tetra fluoride, CHF₃, HCl, boron trichloride and mixtures thereof. Agarwal et al. teach exposing the first conductive layer *in-situ* in column 4 lines 52-58, column 5 lines 60-61 and in column 5 line 59 to a selection of diborane, carbon tetra fluoride, CHF₃, HCl, boron trichloride and mixtures thereof. It would have been an obvious matter of design choice to expose the first conductive layer to a selection of diborane, carbon tetra fluoride, CHF₃, HCl, boron trichloride and mixtures thereof *ex-situ*, since the applicant has not disclosed that exposing the first conductive layer to a nitrogen free gas *ex-situ* solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with *in-situ*.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal et al. in view of Lee (U. S. Patent No: 5,552,341).

Regarding claim 19, Agarwal et al. teach a method of forming a capacitive plate comprising:

Providing, in column 5, line 59, a first conductive layer in a first environment;

Exposing, in column 5, line 65, lines 11-12 and line 62, the first conductive layer to a passivation gas;

Art Unit: 2825

Depositing, a second conductive layer in column 6 lines 21-22, over the first conductive layer.

Agarwal et al. lack exposing the first conductive layer to silane in a second environment. Lee teaches, in column 9 line 47 using silane in a second environment to treat the first conducting layer to silane to passivate the first metal layer before forming a second conductive layer over the first conductive layer. It would have been obvious to one having ordinary skill in the art at the time the invention made to combine the teachings of Agarwal et al. with that of Lee to expose the first conductive layer to silane in a second environment with the objective of passivating the first conductive layer before further processing.

Allowable Subject Matter

Claims 22-24 and 78 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The primary reason for the indication of the allowability of claims 22-24 is the inclusion therein, in combination as currently claimed, of the limitation of providing the first conductive layer in an oxygen-free environment, exposing the conductive layer to a nitrogen free passivation gas in the oxygen free environment and depositing a second conductive layer in a nitrogen free environment in a method of forming a capacitor.

The primary reason for the indication of the allowability of claim 78 is the inclusion therein, in combination as currently claimed, of the limitation of not exposing the first

Art Unit: 2825

conductive layer to oxygen between being provided in the first environment and being exposed to the plasma in the second environment.

Remarks

In view of the amendments and in view of the discovery of new references the indication of the allowability of claim 19 is withdrawn.


In view of applicant's remarks regarding claims 20 and 21 objections to claims 20 and 21 are withdrawn.

Closing

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Belur V Keshavan whose telephone number is 703 306 5985. The examiner can normally be reached on 8-4:30 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 703 308 1323. The fax phone numbers for the organization where this application or proceeding is assigned are 703 305 3431 for regular communications and 703 305 3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

Bvk 
April 9, 2002

Belur V. Keshavan
Examiner. Art Unit 2825.


CARIDAD EVERHART
PRIMARY EXAMINER